Diabetes Deaths Among San Bernardino County Residents: A Statistical Fact Sheet

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About Diabetes

Diabetes is a group of diseases in which blood glucose levels are above normal due to defects in insulin production, insulin action, or both. Diabetes can affect many parts of the body and can lead to serious complications including heart disease, kidney damage, blindness and lower-limb amputations. Type 1 diabetes develops when the body's immune system destroys pancreatic beta cells, the only cells in the body that make the hormone insulin that regulates blood glucose. Risk factors for type 1 diabetes may include autoimmune, genetic and environmental factors. Type 2 diabetes usually begins as insulin resistance, a disorder in which the cells do not use insulin properly. Type 2 diabetes may account for about 90-95 percent of all diagnosed cases of diabetes. Risk factors associated with type 2 diabetes are older age, obesity, family history of diabetes, history of gestational diabetes, impaired glucose metabolism, physical inactivity and race/ethnicity.[1]

In 2002, approximately 6.3 percent of all Americans – 18.2 million people – had diabetes. Of the population aged 20 years or older, 8.7 percent had diabetes in 2002; over 18 percent of the population aged 60 years or older had diabetes. Diabetes prevalence among men and women aged 20 years or older was quite similar – 8.7 percent of all men and 8.7 percent of all women in this age group had diabetes in 2002. Hispanic and non-Hispanic Black Americans were more likely to have diabetes than non-Hispanic Whites of similar age, by 1.5 and 1.6 times, respectively. Alaska Natives and American Indians are 2.3 times as likely to have diabetes as non-Hispanic Whites of similar age.[1]

According to the Centers for Disease Control and Prevention, diabetes was the sixth leading cause of death listed on U.S. death certificates in the year 2000. It is, however, likely to be underreported as a cause of death. Overall, the risk of death for people with diabetes is about 2 times that of people who do not have diabetes. Studies have found, however, that only 35 to 40 percent of decedents with diabetes have diabetes listed anywhere on the death certificate and only 10 to 15 percent have it listed as the underlying cause of death. Heart disease and stroke are the most likely causes to be listed as the underlying cause of death among decedents with diabetes, as 65 percent of deaths among these people are due to these causes.[1]

Diabetes as a Cause of Death

Customarily, only the underlying cause of death is considered when analyzing deaths due to a specific disease. However, for the purpose of this fact sheet, a diabetes death is defined as a death for which diabetes was listed on the death certificate as *either the underlying or a contributing cause of death*. The U.S. Department of Health and Human Services uses this definition in its document *Healthy People 2010: Understanding and Improving Health*, which serves as a roadmap for improving the health of all people in the United States. Objective 5-5 in *Healthy People 2010* is to reduce the age-adjusted diabetes death rate to 45 deaths per 100,000 population by the year 2010,[2] where a death is defined as a diabetes death if diabetes is mentioned at all on the death certificate, regardless of the underlying cause of death.

The table below presents age-adjusted diabetes death rates using the customary underlying cause of death compared to rates using the *Healthy People 2010* definition of diabetes deaths. As the data show, there are very large differences between the two sets of rates. If diabetes deaths were defined as only those for which diabetes was the underlying cause, the *Healthy People 2010* objective would have been surpassed in 2003 for almost every population group in San Bernardino County. However, the rates consistent with the *Healthy People 2010* definition of a diabetes death demonstrate that the county is far from reaching the goal.

When comparing diabetes death rates presented in this fact sheet to rates found elsewhere, it is critical to note what constitutes a diabetes death for each rate. Comparing rates calculated using inconsistent definitions for the cause of death will most certainly lead to erroneous conclusions.

Diabetes Death Rates by Gender and Race/Ethnicity
Comparison Between Diabetes as Underlying or Multiple Cause of Death and Underlying Cause Only
San Bernardino County Residents, 2003

Population	Diabetes listed as underlying *or* contributing cause (*Healthy People 2010* objective=45.0)	Diabetes listed as underlying cause only
All Residents	121.9	31.0
Gender		
Female	104.2	27.1
Male	144.3	35.3
Race/Ethnicity		
Black	166.1	51.0
Hispanic	126.0	35.7
White	128.3	30.7

Note: Table presents age-adjusted death rates per 100,000 specified population. See page 8 for a more detailed definition of age-adjusted death rate.

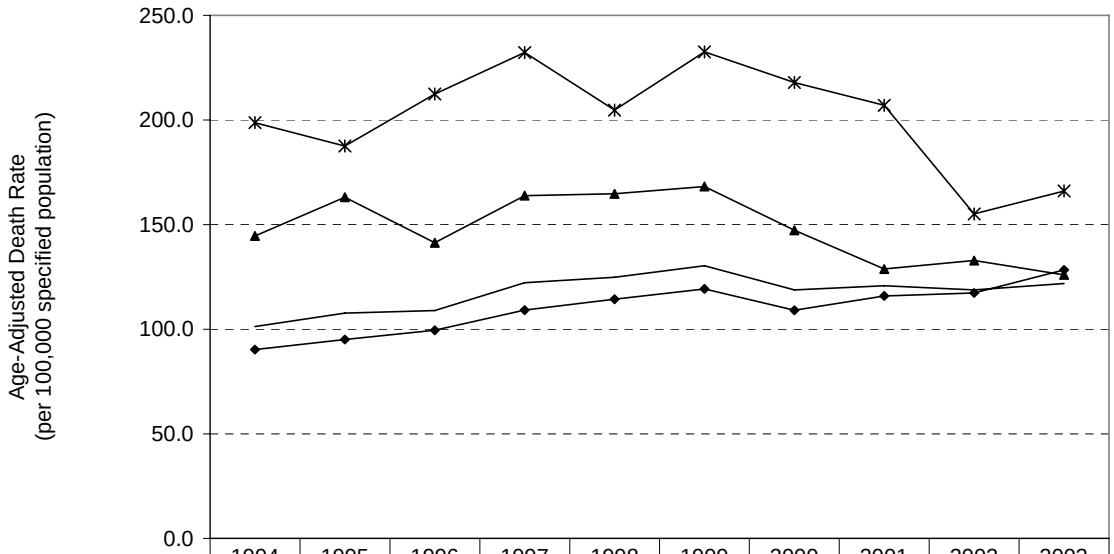
Sources: (1) California Department of Health Services, Death Files.
(2) California Department of Finance, *Race/Ethnic Population with Age Sex Detail, 2000-2050*, May 2004.

Death Rates by Race/Ethnicity

Diabetes death rates among San Bernardino County residents of all races combined showed an increasing trend during the ten-year period, with a peak occurring in 1999. Rates for White residents followed the same trend, with an overall increase of 42 percent from 1994 to 2003. Diabetes death rates among Black and Hispanic residents increased from 1994 to a peak in 1999, but have been decreasing since. Overall, death rates among Blacks and Hispanics decreased during the ten-year time period by 16 percent and 13 percent, respectively.

Although diabetes death rates decreased among Black and Hispanic residents, they were significantly higher than those among White residents. The gap between the racial/ethnic groups had narrowed significantly by 2003, however. In 1994, rates among White residents were 120 percent lower than Blacks' rates and 60 percent lower than Hispanics' rates. In 2003, the difference between Blacks' and Whites' rates had decreased to 29.5 percent, and the rate for Hispanics was almost 2 percent lower than the rate for Whites.

Diabetes Death Rates by Race/Ethnicity
San Bernardino County Residents, 1994-2003



	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
White	90.3	95.1	99.5	109.2	114.3	119.2	109.1	115.9	117.3	128.3
Black	198.8	187.5	212.4	232.3	204.7	232.5	217.9	207.0	155.1	166.1
Hispanic	144.6	163.1	141.3	163.9	164.8	168.2	147.3	128.8	132.9	126.0
All Races	101.2	107.7	109.0	122.2	124.8	130.3	118.8	120.9	118.8	121.9

Year

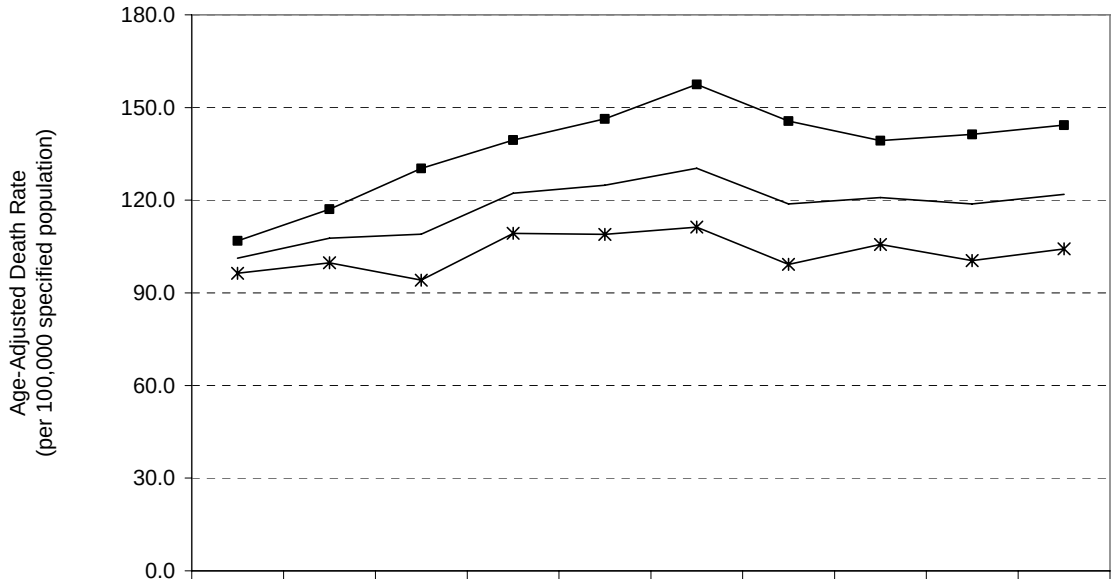
Sources: (1) California Department of Health Services, Death Files.
(2) California Department of Finance, *Race/Ethnic Population with Age Sex Detail, 2000-2050*, May 2004.

Death Rates by Gender

Diabetes death rates for all San Bernardino County residents increased during the ten-year period from 1994 to 2003. Rates among females increased overall but dipped in 1996, 2000 and 2002. Rates among male residents peaked in 1999, decreased until 2001, and have been increasing since.

While rates increased over the ten-year period for all residents by 20.5 percent, male residents had higher diabetes death rates than female residents every year from 1994 to 2003. In 1994, rates among male residents were 11 percent higher than rates among females. In 2003, however, rates for males were almost 39 percent higher than rates for females. Overall, diabetes death rates among male residents increased by about 35 percent, over four times the increase in rates among females (8 percent).

Diabetes Death Rates by Gender
San Bernardino County Residents, 1994-2003



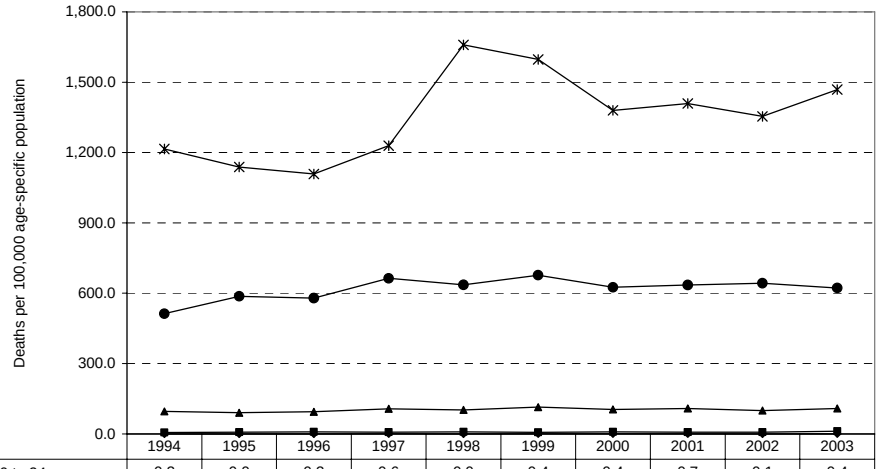
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Female	96.3	99.7	94.1	109.3	108.9	111.3	99.2	105.6	100.4	104.2
Male	106.8	117.1	130.3	139.4	146.3	157.5	145.6	139.3	141.3	144.3
Both	101.2	107.7	109.0	122.2	124.8	130.3	118.8	120.9	118.8	121.9

Sources: (1) California Department of Health Services, Death Files.
(2) California Department of Finance, *Race/Ethnic Population with Age Sex Detail, 2000-2050*, May 2004.

Death Rates by Age Group and Average Age at Death

Diabetes death rates for residents of all ages increased from 1994 to 2003. Rates were highest for residents aged 85 years and older. Residents between ages 25 and 64 had substantially lower diabetes death rates than those aged 65 and older. Residents under 25 years of age rarely died due to diabetes in San Bernardino County from 1994 to 2003.

Diabetes Death Rates by Age Group
San Bernardino County Residents, 1994-2003*



	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
0 to 24 years	0.3	0.0	0.3	0.6	0.0	0.4	0.4	0.7	0.1	0.4
25 to 44 years	6.5	7.5	8.8	7.4	8.9	7.0	9.3	7.4	7.5	11.6
45 to 64 years	96.6	90.5	94.6	107.5	102.3	114.5	104.9	108.6	100.1	109.2
65 to 84 years	513.1	587.3	579.4	663.8	635.5	676.7	625.3	635.5	643.0	622.9
85 years and over	1,215.0	1,138.1	1,108.5	1,229.0	1,659.0	1,597.1	1,379.7	1,409.0	1,354.3	1,468.7

Year

On the average, Hispanic and Black residents died younger from diabetes than White residents during the three-year time period 2001-2003, by 3 and 5 years, respectively. Male residents died over four years younger than females during the same time period. Overall, average age at death for diabetes among all residents did not change much from 1994-1996 to 2001-2003.

Average Age at Death for Diabetes by Race/Ethnicity and Gender
San Bernardino County Residents, Years 1994-1996 and 2001-2003*

Population	Average Age at Death in Years	
	1994-1996	2001-2003
Black	68.7	67.8
Hispanic	69.5	69.7
White	72.1	72.8
All Females	72.6	73.7
All Males	69.7	69.3
All Residents	71.2	71.5

*Data Sources: (1) California Department of Health Services, Death Files.
(2) California Department of Finance, *Race/Ethnic Population with Age Sex Detail, 2000-2050,* May 2004.

Geographic Distribution

From 1994 to 2003, the highest number of deaths due to diabetes was among San Bernardino County residents who lived in ZIP code 92335 (Fontana City). Of the 13,422 deaths due to diabetes over the ten-year period, 5.6 percent were among residents who lived in this ZIP code.

Although 5.6 percent of all the diabetes deaths during this ten-year time period were among residents in ZIP code 92335 (Fontana City), residents in this same ZIP code represented 4.3 percent of deaths due to all causes during this time period. This difference was also evident in ZIP code 92411 (San Bernardino City), where residents accounted for 2.8 percent of all diabetes deaths and 1.8 percent of deaths from all causes.

These geographic statistics regarding diabetes deaths are applicable to the specified ZIP code level, not necessarily the city level. This is due to the fact that many cities are comprised of more than one ZIP code. Therefore, conclusions regarding a particular ZIP code may not be the same conclusions about the entire city. For example, just because residents living in ZIP code 92335 accounted for the highest percentage of diabetes deaths does not mean that Fontana City, as a whole, accounted for the highest percentage of diabetes deaths.

ZIP Codes with Most Diabetes Deaths as Compared to All Deaths
San Bernardino County Residents, 1994-2003

ZIP Code	Location	Number of Diabetes Deaths	Percent of Diabetes Deaths	Percent of All Deaths
92335	Fontana	756	5.6	4.3
92392	Victorville	636	4.7	5.1
92404	San Bernardino	630	4.7	4.7
92376	Rialto	616	4.6	4.0
92345	Hesperia	558	4.2	4.7
92399	Yucaipa	500	3.7	4.5
92324	Colton	455	3.4	2.6
91710	Chino	433	3.2	2.9
91786	Upland	406	3.0	3.3
92311	Barstow	399	3.0	2.6
91762	Ontario	386	2.9	2.7
92411	San Bernardino	376	2.8	1.8
92410	San Bernardino	369	2.7	2.5
92373	Redlands	356	2.7	3.2
92346	Highland	346	2.6	2.7
All	San Bernardino County	13,422		

Source: California Department of Health Services, Death Files.

Summary of Diabetes Deaths

From the years 1994 through 2003, there were a total of 13,422 deaths due to diabetes among San Bernardino County residents. Female residents accounted for the majority of diabetes deaths from 1994 to 1998, while males comprised the majority from 1999 to 2003. Male residents, however, maintained higher diabetes death rates than females throughout the ten-year period (see Technical Notes on page 8 for explanation of *age-adjusted death rate*).

White residents had the highest number of diabetes deaths during the ten-year period, followed by Hispanic and Black residents. Diabetes death rates, however, were highest among Black residents every year from 1994 to 2003. Hispanic residents showed the largest percentage increase in the number of diabetes deaths from 1994 to 2003 (86 percent).

Even though residents between the ages of 65 and 84 years had the highest number of diabetes deaths when compared to other age groups, death rates among residents age 85 years and older were highest. Residents between the ages of 25 and 44 years showed the largest percentage increase in the number of diabetes deaths over the ten-year period (97 percent).

Number of Deaths due to Diabetes by Gender, Race/Ethnicity, and Age Group
San Bernardino County Residents, 1994-2003

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total	1,033	1,112	1,136	1,303	1,337	1,464	1,429	1,493	1,505	1,610
Gender										
Female	561	589	561	665	673	719	681	741	724	781
Male	472	523	575	638	664	745	748	752	781	829
Race/Ethnicity										
White	705	739	771	846	881	944	896	936	930	1007
Black	85	90	107	139	124	148	152	159	141	155
Asian/Pacific Islander	27	34	25	23	33	32	34	51	44	42
American Indian	5	2	6	6	5	4	9	12	12	9
Other/Unknown	1	1	0	0	0	1	1	1	0	5
Hispanic	210	246	227	289	294	335	337	334	378	392
Age Group										
0 to 24 years	2	0	2	4	0	3	3	5	1	3
25 to 44 years	33	38	45	38	46	36	48	39	41	65
45 to 64 years	241	233	253	299	297	349	339	367	353	403
65 to 84 years	603	693	690	800	777	852	825	856	886	884
85 years and over	154	148	146	162	217	224	214	226	224	255

Source: California Department of Health Services, Death Files.

Technical Notes

Age-adjusted death rate: The age-adjusted death rates presented in this fact sheet were calculated using the direct method and do not include decedents of unknown age. The rate is computed by grouping the populations into subsets by age, calculating an age-specific death rate for each group, then deriving a composite death rate by weighting each age category in proportion to its occurrence in a standard population, in this case the 2000 U.S. standard million population. Age-adjusted death rates permit the comparison of populations with disparate age structures as if the populations had similar age distributions. This means that when comparing age-adjusted rates between two or more populations, remaining differences in the rates must be explained by factors other than age. For more information about age-adjusted rates, please see the Centers for Disease Control and Prevention's definition of age-adjustment at: http://www.cdc.gov/nchs/datawh/nchsdefs/ageadjustment.htm.

Age-specific death rate: The age-specific death rates presented in this fact sheet were obtained by dividing the number of deaths in the specified age group by the estimated population in that specified age group and multiplying by 100,000.

$$\text{Age-specific death rate} = \frac{\text{number of deaths in an age group}}{\text{population size in same age group}} \times 100{,}000$$

Race/ethnicity: The following six mutually exclusive race/ethnicity groups were used to report the mortality data presented in this fact sheet: (1) White, Non-Hispanic; (2) Black, Non-Hispanic; (3) Asian/Pacific Islander, Non-Hispanic; (4) American Indian, Non-Hispanic; (5) Other/Unknown, Non-Hispanic; and (6) Hispanic. The Hispanic ethnic group includes any race. The racial/ethnic category of *Multiple Race* was not included in the analyses for this fact sheet.

Cited References

1. Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, *National Diabetes Fact Sheet, United States, 2003*, http://www.cdc.gov/diabetes/pubs/pdf/ndfs_2003.pdf (accessed September 2005).

2. U.S. Department of Health and Human Services. *Healthy People 2010: Understanding and Improving Health*. 2nd ed. Washington, DC: U.S. Government Printing Office, November 2000, http://www.healthypeople.gov (accessed October 2005).

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